

REMARKS

I. Status of Claims

Claims 36-70 are pending and stand rejected. In this amendment, claim 36 has been amended to recite the limitations of claim 65 (that the flame-retardant inorganic filler is added to the flame-retardant polymeric material in an amount of 120 to 200 parts by weight with respect to 100 parts by weight of the expandable polymer) and claim 70 (that the expansion degree of the flame-retardant polymeric material is 20% to 50%), and also to improve its clarity. Hence, claims 65 and 68-70 have been cancelled without prejudice or disclaimer. The amended claims have Section 112 support in the as-filed specification, including page 25, lines 7-8. Applicants have also added new claim 71 directed to wherein the expanded flame retardant polymeric material has an expansion degree of 30% to 50%. The new claim has Section 112 support in the specification at page 25, lines 24 and 26, and Example 2 ("about 30"). See M.P.E.P. § 2163.05 (discussing how a disclosure of "25%-60%" with examples of 36% and 50%, provides written description support for a claim to "between 35% and 60%"). Thus, no new matter has been added.

Accordingly, claims 36-64, 66, 67 and 71 are pending for consideration on their merits.

Applicants respectfully acknowledge that the Office has withdrawn the 35 U.S.C. § 103(a) rejection based on U.S. Application No. 2003/0059613 to Tirelli et al. ("Tirelli") in view of Japanese Patent App. No. 2000-106041 to Otani ("Otani"). See Office Action at 10.

II. 35 U.S.C. § 103 Rejections

The Office rejects claims 36-70 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Tirelli in view of Otani, and further in view of WO 02/47092 to Belli et al. ("Belli") for the reasons provided at pages 2-10 of the Office Action. Applicants respectfully disagree and traverse for the reasons set forth below.

With respect to obviousness, several basic factual inquiries must be made in order to determine the obviousness or non-obviousness of claims under 35 U.S.C. § 103. These factual inquiries, set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459, 467 (1966), require the Examiner to:

- (1) Determine the scope and content of the prior art;
- (2) Ascertain the differences between the prior art and the claims in issue;
- (3) Resolve the level of ordinary skill in the pertinent art; and
- (4) Evaluate evidence of secondary considerations.

The obviousness or nonobviousness of the claimed invention is then evaluated in view of the results of these inquiries. *Graham*, 383 U.S. at 17-18, 148 U.S.P.Q. at 467; *see also KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1730, 82 U.S.P.Q.2d 1385, 1388 (2007).

A. Tirelli, Otani, and Belli, Fail to Teach or Suggest a Process With Each and Every Limitation in Applicants' Independent Claim

With regard to claim 36, the Office admits that Tirelli "is silent to at least one expanding agent blended with 100 parts by weight of a flame-retardant filler." Office Action at 3. Hence, the Office relies upon Otani, stating that Otani teaches that "fire

retardant and foaming agents are blended with olefin system resin to produce the non-halogen fire retardancy sheath” and “50-200 weight-section combination of such fire retardant is carried out to olefin system resin 100 weight section.” *Id.* at 3.

Yet the combination of Tirelli and Otani (with or without Belli) fails to teach or suggest the limitations of presently amended claim 36; i.e., the combination of “at least one coating” that comprises “at least one flame-retardant inorganic filler in an amount of 120 parts by weight to 200 parts by weight with respect to 100 parts by weight of the polymer” **with** “the expanded flame retardant polymeric material [having] an expansion degree of 20% to 50%.”

While Otani teaches the broad ranges of 50-200 parts by weight filler and a degree of expansion of 20-50%, Otani does not teach or suggest to a person of ordinary skill in the art that its disclosure applies to every combination of those ranges. In fact, Otani teaches away from the claimed invention. Table 1 of Otani suggests to a person of ordinary skill in the art that the degree of expansion claimed by Applicants (20-50%) is not achievable with filler in the amount claimed by Applicants (120-200 parts per 100 parts polymer). For example, of the three examples in Table 1 that have filler in an amount of 120-200 parts by weight with respect to 100 parts by weight of the polymer, none shows a foaming rate higher than 7%. See Otani at 28-29 (embodiments 3, 6, 7). More importantly, Otani expressly teaches a preference for a degree of expansion of 7-15% because “if the sheath foaming rate exceeds 20%, the tensile strength thereof falls below the required strength.” Otani at 11. Hence, a person of ordinary skill in the art

would not combine Tirelli and Otani to arrive at a process that achieves a cable with the combination of the claimed degree of expansion with the claimed amount of filler.

The reason for Otani suggesting that the claimed combination is not achievable is that Otani did not recognize a means to successfully arrive at the claimed combination: the use of a static mixer. It is through the use of static mixer that Applicants discovered that the expanding agent is sufficiently mixed despite the presence of high levels of filler. By being sufficiently mixed, the higher degrees of expansion are achieved.

Belli adds nothing to the disclosure of Tirelli and Otani with regard to filler and foaming rate. As Applicants presently understand Belli, it does not teach or suggest use of a foaming or expanding agent and uses a dielectric liquid instead of an flame-retardant inorganic filler, and thus fails to disclose either of the above limitations from Applicants' claim 36.

Accordingly, the combination of Tirelli, Otani, and Belli fails to teach or suggest these limitations of Applicants' independent claim and, thus, the rejection should be withdrawn.

B. No Basis to Combine Tirelli with Otani and Have a Reasonable Expectation of Success

The Office argues that:

it would have been obvious . . . to have modified the process for manufacturing a self-extinguishing cable comprising at least one conductor (transmissive element) and at least one flame-retardant coating of TIRELLI et al. to include the addition of the foaming agent (expanding agent) taught by

OTANI for the benefits of producing a flexible non-halogen self-extinguishing cable with sufficient tensile strength for improved handling nature and workability as well as secure fire retardancy.

Office Action at 3-4; however, as noted above, a closer review of the cited references does not support this conclusion.

First, the Office has not shown that a person skilled in the art would believe that the cable of Tirelli would be improved in the manner suggested. In fact, there is no evidence that the cables of Tirelli need improvement with respect to flexibility and tensile strength.

Second, the Office has not shown that merely adding a foaming agent is tied to the asserted properties. In fact, Otani teaches that if a large amount of filler is used, tensile strength decreases as the foaming rate increases. *See, e.g.*, Otani at 11, 28-29. Thus, adding a foaming agent to the composition of Tirelli, which must use an adequate amount of flame-retardant filler “to obtain a cable which is capable of passing flame/fire-propagation tests,” (Tirelli at ¶ [0054]) would seem to offer no benefits and instead would worsen the cable’s mechanical properties. As such, one of ordinary skill in the art would have no reasonable expectation that modifying Tirelli in view of Otani would successfully confer any benefit to the cables disclosed in Tirelli.

Accordingly, the combination of Tirelli, Otani, and Belli fails to render the claims obvious and, thus, the rejection should be withdrawn.

C. No Basis to Combine Tirelli/Otani with Belli and Have a Reasonable Expectation of Success

The Office also admits that both Tirelli and Otani “are silent to passing the flame-retardant polymeric material through at least one static mixer prior to deposition by the said extruder.” Office Action at 4. The Office argues, however, that:

it would have been obvious . . . to have combined the teachings of TIRELLI et al. and OTANI with BELLI et al. for producing a coating layer that includes expandable polymer, expanding agent, and flame retardant inorganic filler substantially uniformly mixed throughout the thickness of said coating by a static mixer of BELLI et al. for the benefits of obtaining a highly reliable cable that is suitable for electrical power transmission and/or distribution.

Id. at 4-5. The Office states that Belli teaches that “the process for coating the cable with such expandable polymer comprises extruding the polymer and passing it through a static mixer prior to depositing it onto a conductor.” *Id.* at 4.

Yet one of ordinary skill in the art would have no reason to apply Belli’s static mixer with the combined processes of Tirelli or Otani because Belli’s teachings with respect to the static mixer relate to a different composition with different physical properties. While Tirelli and Otani teach flame-retardant compositions comprising polymer and inorganic filler (i.e. a solid), Belli discloses the use of a static mixer for mixing a non-crosslinked thermoplastic polymer and a dielectric liquid. *See, e.g.*, Belli at 6-7. The static mixer is selected “to optimize the mixing of the dielectric **liquid** into the thermoplastic material such that said dielectric **liquid** can be uniformly distributed throughout the thickness of the coating to be produced.” *Id.* at 21.

Belli does not teach or suggest using a static mixer to optimize the homogeneity of a solid material in the polymeric material, particularly in view of the fact that a large amount of flame-retardant filler is known to hamper homogeneous distribution of foaming agent. The physical properties of the materials mixed in the static mixer in Belli thus differ from those mixed by the static mixer in Applicants' claims, and Belli offers no disclosure to suggest that a static mixer would have a beneficial effect on the compositions of Tirelli or Otani. As such, a person of ordinary skill in the art would have no reasonable expectation of success for adding the static mixer of Belli to allow relatively high amounts of flame-retardant filler to be effectively admixed with an expanding agent in a flame-retardant polymeric material.

Accordingly, the combination of Tirelli, Otani, and Belli fails to render the claims obvious and, thus, the rejection should be withdrawn.

III. Conclusion

In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration of this application and the timely allowance of the pending claims. If the Examiner believes a telephone conference could be useful in resolving any outstanding issues, she is respectfully invited to contact Applicants' undersigned counsel at (202) 408-4275.

Please grant any additional extensions of time required to enter the attached reply and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: January 7, 2011

By: 

Anthony Hartmann
Reg. No. 43,662
(202) 408-4000